Determinants of Capital Adequacy Ratio in Banking Sector of Greece

Ilona Badalashvili

SCHOOL OF ECONOMICS, BUSINESS ADMINISTRATION & LEGAL STUDIES

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Student Name: Ilona Badalashvili

SID: 1103150001
Supervisor: Dr. George Dotsis

I hereby declare that the work submitted is mine and that where I have made use of another's work, I have attributed the source(s) according to the Regulations set in the Student's Handbook.

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Contents

Abstract

This thesis analyses the determinants of capital adequacy ratio in the banking sector of Greece. The study is based on banks' quarterly reports and data from Bankscope and ThomsonOne. The data is spanning fifteen years around the period 2001-2015 and includes the four largest systemic Greek banks, since their assets represent more than 90 percent of the Greek banking system. The results are from unbalanced panel data and a random-effect model is used. Findings suggest that there is a positive correlation between return on assets, asset structure, inflation and capital adequacy ratio, while net interest margin, non-performing loans and unemployment have negative correlation with capital adequacy ratio. Return on assets, net interest margin, and inflation do not have an influence on how the capital adequacy ratio is determined. Non-performing loans, asset structure and unemployment seems to have a strong impact on capital adequacy ratio of Greek banks. Although this paper is focused on Greek economy, it may help identify the correlates of bank capital ratios in the surrounding regions of Balkan.

Keywords: Capital Adequacy Ratio, Determinants of CAR, Greece

Introduction

The financial crisis of 2008 was just one of the many crises that afflicted the global economy over time. Financial crises occur for several reasons, but in the 19th and early 20th centuries, many financial crises were associated with banking panics. The need for rules and restrictions that would be followed by banks worldwide became an urgent need.

The collapse of the German bank "Herstatt" on June 1974, and then of the US's bank "Franklin National" in October of the same year, focused the interest of the financial authorities to the cooperation between individual national banking systems. As a result of this turmoil, in the end 1974 it was established a Committee on Banking Regulations and Supervisory Practices, which later renamed the Basel Committee on Banking Supervision.[1]

Since then the Basel Committee is working on developing banking regulation rules. The latest amendment was introduced after the financial crisis of 2007-08, and it brought several innovations concerning banking risk regulation. Extra capital buffers were introduced (the capital conservation buffer), the minimum liquidity coverage ratio (LCR) requirement begins at 60% in 2015, rising in equal annual steps of 10 percentage points to reach 100% on 1 January 2019, finally the unweighted capital ratio was introduced to be monitored in parallel the risk-weighted ratio.[2]

In 1998 the Basel Committee on Banking Supervision introduces the Cooke Ratio, which is the minimum amount of capital a bank should maintain in case of unexpected losses. The Cooke Ratio has two objectives a) to provide a balance between the capital hold by the banks and the taken risk and b) strengthen the soundness and stability of the banking system. It is measured as follows:

$$Cooke\ ratio = \frac{Bank's\ Capital}{Risk\ Weighted\ Assets}$$

The risk weighted assets are defined as the banks' assets weighted by its risk weight. The risk weight assets are computed using the following formula:

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[1]Basel Committee on Banking Supervision (2015), "A Brief History of the Basel Committee", p. 1. (http://www.bis.org/bcbs/history.pdf)

[2]Henry Penikas, History of banking regulation as developed by the Basel Committee on banking supervision in 1974–2014, pp. 16-17. (http://www.bde.es/f/webbde/GAP/Secciones/Publicaciones/InformesBoletinesRevistas/RevistaEstabilidadFinanciera/15/MAYO%202015/restfin2015281.pdf)

$$Risk\ Weighted\ Assets = Exposure\ at\ Default * Risk\ Weight$$

The original Basel Accord uses only credit risk and classifies banks' exposures into four categories as we can see in table 1. Cash, claims on OECD central governments and claims on central governments in national currency are risk weighted at 0%. Claims to be received, claims on OECD banks, on non-OECD banks below one year, claims on multinational development banks and claims on foreign OECD public-sector entities are risk weighted at 20%. Residential mortgage loans are risk weighted at 50%. Claims on the private sector, claims on non-OECD banks above one year, real estate and plant and equipment are risk weighted at 100%.

Table 1. Four categories of banks exposures according to the original Basel Accord.

Weights	Asset Type
0%	Cash held
	Claims on OECD central governments
	Claims on central governments in national currency
20%	Cash to be received
	Claims on OECD banks and regulated securities firms
	Claims on non-OECD banks below one year
	Claims on multilateral development banks
	Claims on foreign OECD public-sector entities
50%	Residential mortgage loans
100%	Claims on the private sector (corporate debt, equity, etc.)
	Claims on non-OECD banks above one year
	Real estate
	Plant and equipment

The available options that are at one's disposal for computing capital for credit risk are Standardised Approach, Foundation Internal Rating Based Approach and Advanced Internal Rating Based Approach. The available options for computing capital for operational risk are Basic Indicator Approach, The Standardised Approach and Advanced Measurement Approach.[3] Table 2 presents the time schedule for the implementation of the advanced approaches for the regulatory capital measurement in July 2009.

[3] https://rbidocs.rbi.org.in/rdocs/content/pdfs/114BI010714LA.pdf p. 6.

Table 2. Schedule for the implementation of the advanced approaches for the regulatory capital measurement in July 2009.

S. No.	Approach	The earliest date of making application by banks to the RBI	Likely date of approval by the RBI
a.	Internal Models Approach (IMA) for Market Risk	April 1, 2010	March 31, 2011
b.	The Standardised Approach (TSA) for Operational Risk	April 1, 2010	September 30, 2010
c.	Advanced Measurement Approach (AMA) for Operational Risk	April 1, 2012	March 31, 2014
d.	Internal Ratings-Based (IRB) Approaches for Credit Risk (Foundation- as well as Advanced IRB)	April 1, 2012	March 31, 2014

The purpose of bank regulation is to ensure that a bank keeps enough capital for the risks it takes.[4] Governments want to create stable economic environment for individuals and businesses, in order to inspire confidence in the banking system, and if it is necessary the government bears the risks and potential losses of a disruption in the banking system ("Too Big to Fail" policy, lender of last resort, forbearance). However, some financial institutions disregard the measures proposed by the Basel Committee, which in some circumstances has cause their failure. Still, the "Too Big to Fail" policy did not work for the Lehman Brothers during the turmoil of 2007 and 2008. The U.S government wanted to make it clear that bailouts for large financial institutions were not automatic.[5]

The Basel III capital requirements are based on three mutually reinforcing pillars: minimum capital requirements, supervisory review of capital adequacy, and market discipline of the Basel II capital adequacy framework. A bank should comply with the capital adequacy ratio requirements at two levels: a) the consolidated level, which measures the capital adequacy of a bank based on its capital strength and risk profile after consolidating the assets and liabilities of its subsidiaries, b) the standalone level capital adequacy ratio requirements, which measure the capital adequacy of a bank based in its standalone capital strength and risk profile.[6]

[4]John C. Hull, Risk Management and Financial Institutions, published by John Wiley & Sons, third edition, 2012, p. 257.
[5]John C. Hull, Risk Management and Financial Institutions, published by John Wiley & Sons, third edition, 2012, p. 258.
[6]https://rbidocs.rbi.org.in/rdocs/content/pdfs/114BI010714LA.pdf p. 8.

Why banks are required to hold capital?

A banks' market capital requirement can be defined as the capital ratio that maximizes the value of a bank in the absence of regulatory capital requirements. This capital ratio may differ among banks, but it is the ratio each bank should converge towards to in the long run. It is worth to mention that the value of a bank will decline whether it has too little or too much capital.[7]

The convergence point for the literature on capital structure is the Modigliani-Miller (1958) proposition, which states that in a world of full information and complete markets, a firm's capital structure cannot affect its value. In order to research the optimal capital structure, we need to examine the imperfections that are inherent in the M&M proposition, such as taxes, cost of financial distress, transactions costs and asymmetry information problems.

As it is known, interest payments are tax-deductible but dividends are not, so by substituting debt for equity firms can give investors greater return by reducing payments to the government. Financial institutions prefer to finance their activities with debt, but in that way the risk of incurring the costs of financial distress increases. The level at which the tax advantages of additional debt are offset by the increase in the expected costs of financial distress determines the optimal capital structure.[8]

According to NASDAQ, financial distress is *"Events preceding and including bankruptcy, such as violation loan contracts"*.[9] Financial distress has many negative aspects, banks lose value, talented employees may leave, revenues will decrease, and suppliers may demand more timely payments. Part of the costs of financial distress are borne by the banks' creditors and part by shareholders. Creditors may increase the interest rate they require and in turn shareholders may increase the banks' capital ratio to the point that the expected costs of financial distress offset the reduction in the tax benefits of debt.

"Asymmetric information refers to situations, in which some agent in a trade possesses information while other agents involved in the same trade do not".[10] The information held

[7] Allen N. Berger, Richard J. Herring, Giorgio P. Szego, The Role of Capital in Financial Institutions, Working Paper 95-01, January 1995, p.3
[8] Allen N. Berger, Richard J. Herring, Giorgio P. Szego, The Role of Capital in Financial Institutions, Working Paper 95-01, January 1995, p.4
[9] http://www.nasdaq.com/investing/glossary/f/financial-distress
[10] World Bank http://siteresources.worldbank.org/DEC/Resources/84797-1114437274304/Asymmetric_Info_Sep2003.pdf

by banks about their loan customers creates an asymmetric information problem for banks. Banks have more information about their financial condition than the market, which can send signals to the market that can be interpreted in different ways. The decision about funding the new investments with debt or equity send signal to investors and they act in a specified way.

The financial crisis of 2007 and the capital adequacy ratio

The financial crisis of 2007-08 triggered the Greek sovereign debt crisis in the late 2009. The falsification of national accounts led to a crisis of confidence. Spreads on bond yield increased and credit rating agencies downgraded Greece's debt to "junk" (BB+).[11] The government-debt crisis deteriorated the banking system. The number of branches and employees of domestic credit institutions reduced from 4.098 and 66.163[12] respectively, before the crisis, to 2.543 and 46.086 in 2015.[13]

When the financial crisis of 2007-08 broke out, the spillover effects on the Greek banking system were limited; it remained healthy and adequately capitalized until the effects of the global recession affected the Greek economy. The public debt crisis in Greece resulted in substantial decline in the capital adequacy ratio of Greek banks. In the first quarter of 2012 the capital adequacy ratio on a consolidated basis fell to 5.2%, a far below the minimum level of 8%. This situation resulted in several tranches of funds to be directed into troubled commercial banks.

Capital controls were introduced in Greece in June 2015, after the negotiations with its European creditors had been suspended, with both sides accusing each other of being responsible. As a result, European Central Bank decided not to further increase the level of its Emergency Liquidity Assistance for Greek Banks. Depositors were allowed to withdraw 420€ per week or 60€ a day. People responded almost instantly to the news; Greek people formed lengthy queues at ATMs during the weekend as it became clear that the country was very close to default.

These circumstances highlighted the problem of the Greek banking system (as well as many other European countries) which was historically conservative and well-capitalized, and

[11] http://news.bbc.co.uk/2/hi/business/8647441.stm

[12] http://www.hba.gr/4Statistika/UplPDFs/6/7.12.2011%20ECB%20publishes%20structural%20financial%20indicators%20for%202010%20%20-%20Table%20.pdf

[13] https://sdw.ecb.europa.eu/servlet/desis?node=1000002869

stricter regulation and supervision were considered necessary to make the banking sector healthy again.

This paper seeks to examine the determinants of capital adequacy ratio (CAR) in the greek banking sector. The analysis includes data before and after the financial crisis of 2007-08, in order to compare and examine the effects of the crisis to the banks' solvency. Through this research we will be able to understand the importance of the capital adequacy ratio and the consequences a bank has with a CAR lower than the minimum of 8%.

It is important to review the capital ratios of Greek banks, due to the consequences of the sovereign crisis on banking sector. The successive downgrades of the credit rating, the restructuring of the public debt through the participation of the private sector, the deterioration of the quality of the loan portfolios of Greek banks, and the banks' lack of access to international capital markets have negatively affected the capital and liquidity of Greek banks.[14]

Capital adequacy ratio is important to determine the solvency of a bank. If the banking system were to go bankrupt, the entire economy would collapse, hence regulatory bodies are interfering to enforce capital ratios. Also, CAR impacts the amount of credit that can be created by the banks. Debates on whether the capital adequacy ratios contribute or not to financial crises reveal the importance of CAR as well.

Banks are required to maintain a minimum Capital to Risk Weighted Assets Ratio of 8%. It should be ensured that the capital held by a bank is commensurate with the bank's overall risk profile. This would include, among others, the effectiveness of the bank's risk management systems in identifying, assessing / measuring, monitoring and managing various risks including interest rate risk in the banking book, liquidity risk, concentration risk and residual risk.[15] If it is necessary, higher level of capital ratio will be set for each bank in respective to their risk profiles.

Components of Capital

A bank should compute Basel III capital ratio as:

[14]Banking Regulation, Global Legal Law, p. 113. (http://www.potamitisvekris.com/wp-content/uploads/2015/01/GLI-BR2_Greece.pdf).
[15]https://rbidocs.rbi.org.in/rdocs/content/pdfs/114BI010714LA.pdf p.10.

$$Total\ Capital = \frac{Tier\ 1\ Capital + Tier\ 2\ Capital}{Credit\ Risk\ RWA + Market\ Risk\ RWA + Operational\ Risk\ RWA}$$

The elements of banks' capital adequacy are the level of equity, that include economic, regulatory and internal capital, and solvency ratio. Banks' capital is divided into core capital (Tier 1), supplementary capital (Tier 2) and short term capital (Tier 3). Subsequently, Tier 1 capital consists of Common Equity Tier 1 (CET1) which, in turn, consists of:

a) Common shares issued by the bank that meet the criteria for the classification for as common shares for regulatory purposes
b) Stock surplus resulting from the issue if instruments including CET1
c) Retained earnings
d) Accumulated other comprehensive income and other disclosed reserves
e) Common shares issued by consolidated subsidiaries of the bank and held by third parties that meet the criteria for inclusion in CET1
f) Regulatory adjustments applied in the calculation of CET1

Tier 1 capital includes paid-up capital, statutory reserves, disclosed free reserves, Perpetual Non-Cumulative Preference Shares, Innovative Perpetual Debt Instruments and capital reserves representing surplus arising out of sale proceeds of asset. Tier 2 capital includes undisclosed reserves, revaluation reserves, general provisions and loss reserves, hybrid capital instruments, subordinated debt and investment reserve account. Finally, Tier 3 capital is arranged to meet part of market size, that is changes in interest rate, exchange rate, equity prices, commodity prices, etc. To quantify Tier 3 capital, assets must be limited to 250% of a bank's Tier 1 capital, be unsecured subordinated and have a minimum maturity of 2 years.[16]

After the creation of the European Banking Union, the EU institutions agreed to establish a Single Supervisory Mechanism and a Single Resolution Mechanism for banks. In turn, the Greek banking law has been greatly modified to comply with the EU legislation.

[16] Nikhat Fatima, Capital Adequacy: A Financial Soundness Indicator for Banks, Global Journal of Finance and Management, Volume 6, Number 8 (2004) p. 772.

Furthermore, the "Hellenic Bank Support Plan" was adopted, with the goal of enhancing Greek banks' capital and liquidity positions.[17]

The capital structure of banks differs greatly from non-financial institutions. Banks act as financial intermediaries and additionally they can fund their activities through deposits. The structure of the Greek banking system has notably changed during the last decades in respond to the changes in international economic/financial environment. In Greece Piraeus Bank is the largest bank by total assets (2015)[18], and together with National Bank of Greece, Alpha Bank and Eurobank Ergasias represent the four systemic Greek banks.

According to the EU capital requirements (CRD IV) package, that entered into force in 2013, the minimum total capital ratio for Greek banks is 8% composed of a Common Equity Tier I capital ratio of 4.5% with the overall minimum Tier I capital ratio being 6%. Additionally, Greek banks are required to increase the capital conservation buffer to 2.5% by 2019, the minimum Common Equity Tier I capital to 7% and the total capital ratio to 10.5% in 2019.[19] Also, a countercyclical buffer of up to 2.5% must be held as expansion of the capital conservation buffer, so the banking sector is protected in a case of excessive credit expansion.

Except for the above capital ratios, the Banking Law requires a minimum paid-up initial capital equal to: 1. €18,000,000 for a Greek credit institution; 2. €9,000,000 for a branch of a credit institution authorised in a third country; and 3. €6,000,000 for the pure credit cooperative of Greek law 1667/1986. The above thresholds may be adjusted by the competent authority to amounts of not less than €5,000,000.[20]

The paper is organized as follows. Sections 2 literature review and main concepts that are used through the study. Section 3 describes data and the methodology used to approach the empirical work. Sections 4 and 5 present and analyse the empirical results. Finally, conclusions and recommendations are provided in section 6.

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[17]Banking Regulation, Global Legal Law, p. 113. (http://www.potamitisvekris.com/wp-content/uploads/2015/01/GLI-BR2_Greece.pdf).
[18] http://www.hba.gr/Hebic/UplPDFs/B2016EN/3a.pdf
[19]Banking Regulation, Global Legal Law, p. 118. (http://www.potamitisvekris.com/wp-content/uploads/2015/01/GLI-BR2_Greece.pdf).
[20]Banking Regulation, Global Legal Law, p. 118. (http://www.potamitisvekris.com/wp-content/uploads/2015/01/GLI-BR2_Greece.pdf).

Literature Review

So far the literature that examines the Greek banking system is limited and it usually focuses on the determinants of bank profitability, and their efficiency rather than on the determinants of their capital ratios.

Capital adequacy ratio ensure that banks will have enough liquidity to absorb losses before they become insolvent, and that makes CAR critical. The more capital a bank has relative to the risks it takes, the more confident the stakeholders are that their interests are protected. Literature accepts various indices like non-performing loans, return on assets, return on equity, and bank size as determinants of capital ratio.

The theoretical background for capital structure was introduced by Modigliani and Miller in 1958.[21] They argued that with perfect capital markets the total value of a firm should not depend on its capital structure.[22] According to Miller there are fundamental differences in bank financing, although not important enough to overturn the M&M proposition.

Berger and Herring (1995) examine why banks are required to maintain certain capital ratios imposed not only by the regulatory capital requirements but by the markets too. They define the market capital requirement as "…*the capital that maximizes the value of the bank in the absence of regulatory capital requirements and all the regulatory mechanisms that are used to enforce them*".[23] They use the term "safety net" to refer to all government actions designed to enhance the safety and soundness of the banking system other than the regulation and enforcement of capital requirements.[24]

Bank's market capital requirement motivates banks to hold additional capital in order to have extra capital during difficult times and at the same time to take advantage of profitable opportunities. In line with markets, regulators require banks to hold additional money for almost the same reasons. Beside the safety net, the regulatory safety net "*protects the safety and soundness of banks and likely lowers bank capital*".[25]

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[21] F. Modigliani and M. Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment", *American Economic Review* 48(3) (1958) pp. 261-297.
[22] Jonathan Berk, Peter DeManzo, Corporate Finance, Pearson International Edition, (2007) pp. 429-430.
[23] Berger, A. N., & Herring, R. J. (1995). The role of capital in financial institutions. Working paper 95-01, p. 3. (http://fic.wharton.upenn.edu/fic/papers/95/9501.pdf).
[24] See note 15, p. 11.
[25] See note 15, p. 52.

Daesik Kim and Anthony M. Santomero (1988) investigate the role of bank capital regulation in risk control. Regulators opt for more capital to less, because the amount of capital hold by banks ensures banks' solvency, and consequently the solvency of the entire banking system. They support that "*stringent capital regulation via a simple capital to asset ratio gives banks an incentive to increase their business risk by portfolio realignment*".[26] The mean-variance model shows that with optimal risk weights the expected utility of banks will be lower than before. Also, banks have incentives to charge higher rates on assets due to different capitalization rates for different assets.[27]

Hannan and Hanweck (1988), support that banks deal with insolvency problems when the current losses exhaust capital completely and when the return on assets is less than the negative capital-asset ratio.

Carmen M. Reinhart and Kenneth S. Rogoff in their paper "From Financial Crush to Debt Crisis" (2011) examine the relationship between debt crisis and banking crisis. Notably, they try to answer the following questions: first, if the external debt surges are an antecedent to banking crisis. Second, if banking crises often precede or accompany sovereign debt crises. Third, if public borrowing surges ahead of external sovereign default, as governments have "hidden domestic debts" that exceed the better documented levels of external debt.[28]

According to Eric A. Posner (2015) it is not clear how regulators determine how high or low the minimum capital adequacy ratio should be. It is revealed that regulators have never performed a serious economic analysis that would justify the levels that they have chosen. Regulators interest in capital adequacy because they want to prevent bank panics and contagions. It is expected that banks with high capital ratios will withstand better in an event of sudden loss, relative to a bank with low CAR. Posner says that most of the justifications about how the of capital levels were set, were "…*terse, opaque, and laden with boilerplate language*".[29] Regulators rarely did cost-benefit analysis, and when they did it was poorly performed. Finally, in 2011 it was prepared a high quality cost-benefit analysis that

[26] Kim, D., & Santomero, A. M. (1988). Risk in banking and capital regulation. The Journal of Finance, 43, N0 5, (DECEMBER 1998) p. 1220.
[27] See note 18, p. 1230.
[28] Carmen M. Reinhart and Kenneth S. Rogoff (2011) From Financial Crash to Debt Crisis. The American Economic Review, Vol. 101 No. 5, pp. 1676-1706.
[29] Eric A. Posner (2015) How do bank regulators determine capital adequacy requirements? The University of Chicago Law Review, Vol. 82 No 4, pp. 1855.

was considered by many as a result of the financial crisis of 2007-08. It is questionable what would be happened if regulators had been required to use cost-benefit analysis before the turmoil of 2007.

What is the optimal level of capital that the banks should maintain? Some academics claim that the capital should be as high as 50 percent. Their opinion is based on the Modigliani-Miller theorem as it was analysed above. If the value of a firm does not depend on its mix of debt and equity there is no economic cost from forcing banks to hold equity. Generally, the view that high capital asset ratios would be socially beneficial prevails among scholars.

At first regulators did not provide any adequate justification on how they set the minimum capital levels and why capital adequacy rules were appropriate to bank regulation. The results of a cost-benefit analysis revealed that the major benefit of capital adequacy regulations is that they reduce the probability of a financial crisis. According to academic literature a financial crisis occurs in a country once every 20-25 years and results in a median loss of 63 percent of Gross Domestic Product.[30]

On the other hand, the major cost of capital adequacy regulations is the limitation of banks' ability to choose the financial arrangements that maximize profits, banks cannot take on too much debt and must issue equity instead.

Does capital adequacy ratio contribute to financial crisis?

This question plagues scholars for many decades. It is questioned if the capital adequacy ratio promotes stability in economy or contributes to financial crisis. Banks with high debt and low level of capital relative to its assets, are more prone to failure in the event of a financial crisis. It is undeniable that banks with higher capital adequacy ratio are less risky and doing better during the crisis. Banks are important because a failure of a banks can trigger a financial crisis and affect adversely the global economy.

When banks are forced to maintain a minimum amount of capital it makes them act in a less risky way because they have more to lose. A distressed bank meets one of the following conditions:

a) Declared bankruptcy

[30] Eric Posner, How Do Bank Regulators Determine Capital Adequacy Requirements? Coase-Sandor Institute for Law and Economics Working Paper No. 698, 2014 p. 26.

b) Taken over by the government or put into government receivership
c) Merged under duress with another bank
d) Received a substantial government bailout

It has been argued that higher levels of minimum capital requirements would prevent banks from failing, and somehow this is outlined in the new Basel III Accord. Although, many scholars support that the minimum capital adequacy ratio will not ensure the financial stability. Sticking point remains the process by which the level of minimum capital adequacy ratio is set. For example, in Basel I Accord the minimum capital adequacy ratio was set to 8 percent and there has never been given any justification on how this quota was chosen. Regulators depend on state to provide them all the information and data they need and that makes capital adequacy ratio subject to political interference.

After the Basel I Accord banks did hold capital above the minimum requirements. Similarly, before the financial crisis of 2007/08 banks' capital ratios exceeded the minimum ratio set by regulators. Nevertheless, higher ratios did not protect them from failure and did not prevent the financial crisis. It is clear that higher capital levels do not guarantee higher prudence and lower risk-taking. The effectiveness of minimum capital requirements is further reduced by regulatory capital arbitrage - techniques that are used by banks in order to circumvent the minimum capital requirements rules. So, the risk can be even greater but the capital levels appear to comply with minimum requirements.

It has been proved that higher minimum requirements reduce the future profits of banks, so it is not for their favour to hold more capital. That can make them invest in riskier assets in an effort to maximize their profits. Although, it can be argued that if banks were operating in unregulated marketplace they would have more incentives to check the riskiness of the assets they hold.

Methodology-Data

This study is interested in determining the factors that affect the capital adequacy ratio of Greek banks. In addition to the data of individual banks the paper uses a number of macroeconomic data drawn for the years 2001-2015 as well. The data set consists of an unbalanced panel data of four Greek commercial banks and covers the period from 2001 to 2015 on a quarterly basis. The total number of observations is 240.

Fixed-Effects VS Random-Effects Model

First, we have to choose between fixed-effect and random-effect model. Fixed-effects models are used when we are interested in analysing the impact of variables that vary over time. Fixed-effects explore the relationship between predictor and outcome variables within an entity (the banks in our case). When using fixed-effects we assume that something within the individual characteristics of the entity may impact or bias the predictor or outcome variables, something we need to check. Fixed-effect model removes the effect of time-invariant characteristics so we can assess the net effect of the predictors on the outcome variable.[31]

Another important assumption is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. One side effect of the features of fixed-effects models is that they cannot be used to investigate time-invariant causes of the dependent variables. Fixed-effects models are designed to study the causes of changes within an entity.[32]

The rationale behind the random effects model is that the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. An advantage of random effect model is that you can include time-invariant variables. Random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. In random effects model you need to specify those individual characteristics that may or may not influence the predictor variables.[33]

In order to examine to what extent the capital adequacy ratio is influenced by the chosen internal and external factors the following regression is considered:

$$Y_{i,t} = \beta_0 + \beta_1 NPL_{i,t} + \beta_3 ROE_{i,t} + \beta_4 NIM_{i,t} + \beta_6 ASSTRCTR_{i,t} + \beta_7 Inflation_t + \beta_8 Umemployment_t + \varepsilon_t$$

[31] Data and statistical services, Panel data analysis, fixed and random effects using Stata, Princeton University, p. 9.
[32] Data and statistical services, Panel data analysis, fixed and random effects using Stata, Princeton University, p. 23.
[33] Data and statistical services, Panel data analysis, fixed and random effects using Stata, Princeton University, pp. 25-26.

Where Y_t is the capital ratio of four major Greek banks (NBG, Piraeus Bank, Alpha Bank, Eurobank Ergasias) at time t; $NPL_{i,t}$ is the ratio of non-performing loans to gross loans of bank i at time t; $NIM_{i,t}$ is the net interest margin of bank i at time t; $ASSTRCTR_{i,t}$ is the asset structure (total assets to loans) of bank i at time t; $Inflation_t$ is the country's inflation at time t; $Umemployment_t$ is the country's unemployment at time t; and ε_t is the error term.

Dependent variable

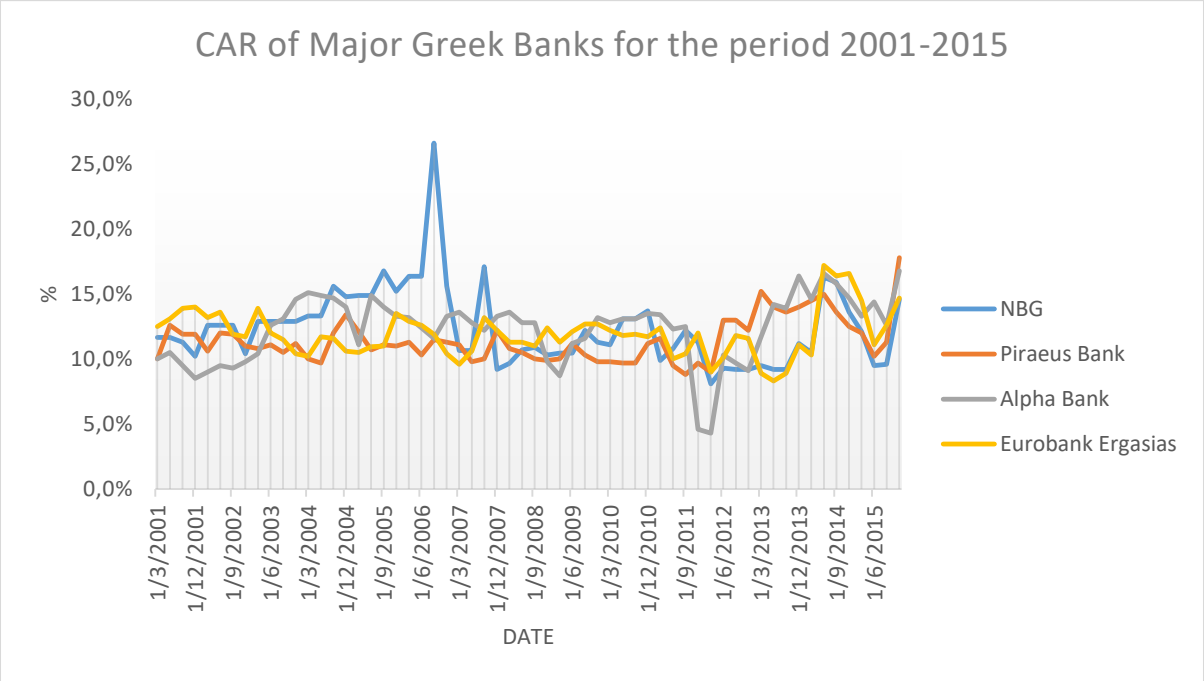
The dependent variable, the CAR ratio, is a measure of a bank's capital and is expressed as a percentage of a bank's risk weighted exposures. It includes, tier I capital (shareholders' equity and retained earnings) which is used to absorb losses without ceasing business operations, and tier II capital (revaluation reserves, hybrid capital instruments and subordinated term debt, general loan-loss reserves, and undisclosed reserves).[34] This ratio is mandatory for banks and it is imposed by regulatory authorities to ensure that the bank has the ability to absorb a reasonable amount of losses. CAR is calculated as:

$$CAR(\%) = \frac{Tier\ I\ capital + Tier\ II\ capital}{Total\ Risk\ Weighted\ Assets} * 100$$

Chart 1 shows how the capital adequacy ratio of the major Greek banks changes during the period 2001 to 2015. The line with blue colour represents the National Bank of Greece. Until September 2006 the capital adequacy ratio increases steadily and reaches 26.6% after that it drops to 15.6% at the end of the same year. At the end of 2007 and beginning of 2008, the capital adequacy ratio decreases considerably not only for the National Bank of Greece but for all four Greek banks. The orange line is for Piraeus Bank. In this case the fluctuation of capital adequacy ratio is more moderate. The higher value where was reached in March 2013 (15.2%) and the lower in September 2011 (8.8%). The grey line stands for Alpha Bank. It can be observed that there is a sharp drop in December 2011 (4.6%) and March 2012 (4.3%). These percentages are lower than the minimum capital level set by regulators. Finally, the yellow line represents the Eurobank Ergasias. In contrast with the previous banks it can be seen that Eurobank's capital adequacy ratio remained relatively stable during the financial crisis of 2007-08.

[34] http://www.investopedia.com/ask/answers/043015/what-difference-between-tier-1-capital-and-tier-2-capital.asp

Chart 1. Capital Adequacy Ratio of Major Greek Banks.



Independent variables

Six explanatory variables are used as determinants of capital adequacy ratio: NPLs, ROE, Net Interest Margin, Asset Structure and two macroeconomic indicators, inflation and unemployment. The selection of these explanatory variables is based on prior studies and research.

NPL: Non-performing loan is a loan on which the borrower is not making interest payments or repaying any principal. "*A loan is non-performing when payments of interest and principal are past due by 90 days or more, or at least 90 days of interest payments have been capitalized, refinanced or delayed by agreement, or payments are less than 90 days overdue, but there are good reasons to doubt that payments will be made in full".*[35] NPLs reflect the quality of a bank's loan portfolio and is accepted as a measurement of default risk.

Loans constitute the main source of credit risk, which is associated with bank asset quality and plays an important role in bank failures. Non-performing loans is an indicator used very often as a measurement of banks' loan portfolio quality. It is well known that the loan quality has greatly deteriorated in recent years, just after the outbreak of the financial crisis in Greece. Table 3 shows the percentage of banks non-performing loans to total gross loans

[35] http://www.imf.org/external/index.htm

from 2001 to 2015. As we can see after 2008 the ratio of NPLs is constantly growing from 4.67% in 2008 to 34.67% in 2015.

Table 3. Non-performing loans of Greek banking sector, 2001-2015.

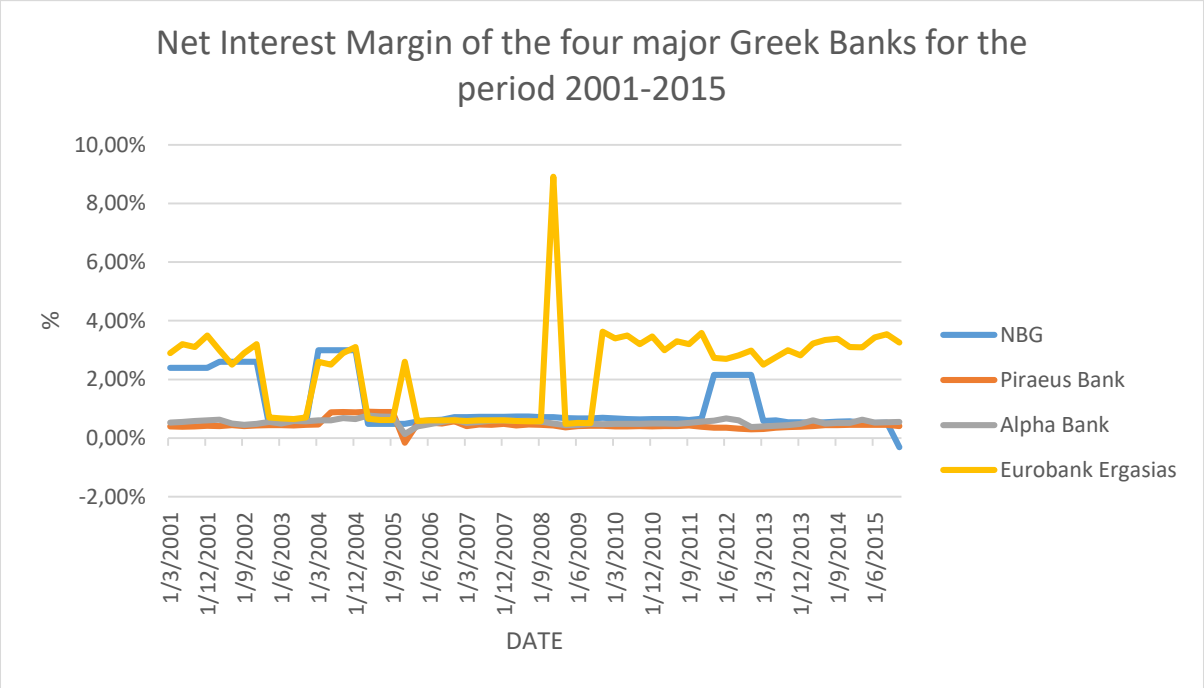
Year	Percentage of NPLs	Year	Percentage of NPLs	Year	Percentage of NPLs
2015	34.67%	2010	9.12%	2005	6.3%
2014	33.78%	2009	6.95%	2004	7%
2013	33.9%	2008	4.67%	2003	7%
2012	23.27%	2007	4.6%	2002	7.4%
2011	14.43%	2006	5.4%	2001	5.6%

Net Interest Margin: Net interest margin is measured as the difference between interest paid and interest received, divided by the total earning assets. The net interest margin measures the gap between what the bank pays savers and what the bank receives from borrowers. It is an indicator of operational efficiency of the bank and the competiveness of the banking market.[36] Studies suggest that there is a positive relationship between net interest margin and bank capital.

Chart 2, shows the net interest margin of the four major Greek banks. The blue graph shows the net interest margin for the National Bank of Greece, the orange for the Piraeus Bank, the grey stands for Alpha Bank and the yellow for Eurobank Ergasias. As we can see Eurobank Ergasias has the higher net interest margin among the four banks and then follows National Bank of Greece, Alpha Bank and Piraeus Bank.

[36] Asli Demirgüç-Kunt, Luc Laeven and Ross Levine, *Regulations, Market Structure, Institutions, and the Cost of Financial Intermediation,* Journal of Money, Credit and Banking, (Jun., 2004), pp. 594-595.

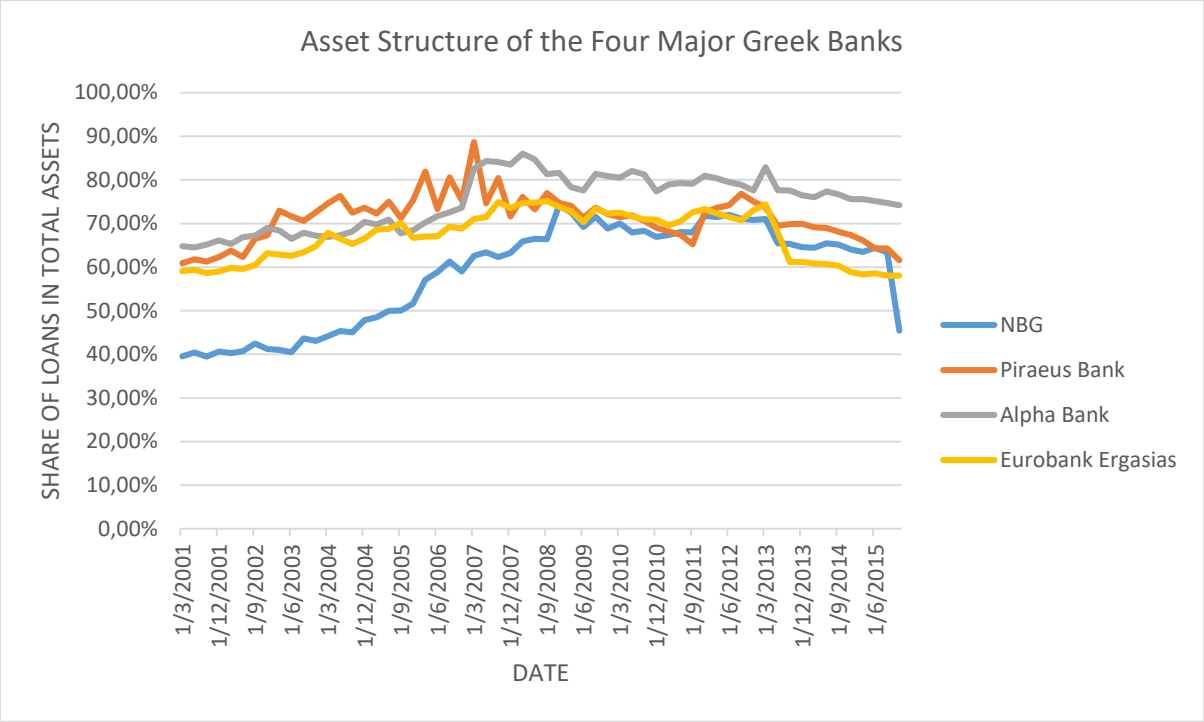
Chart 2. Net Interest Margin of the four Major Greek Banks



Asset structure: asset structure represents the share of loans in total assets and indicates the level assets' risk, since the lending of funds is always connected with some level of uncertainty related to the borrower. The larger the share of loans, the lesser the share of tangible assets which provide the creditors with a guarantee that the money they lend will be repaid. This makes more difficult the financing with debt and affects the capital proportion by increasing the share of equity in total liabilities.

Chart 3 presents the asset structure of the four major Greek banks. The blue graph shows the asset structure of National Bank of Greece, the orange shows the asset structure of Piraeus Bank, the grey shows the asset structure of Alpha Bank and the yellow graph shows the asset structure of Eurobank Ergasias. As we can see National Bank of Greece has the lower share of loans in total assets, especially until 2008. Then follows Eurobank Ergasias, Piraeus Bank and Alpha Bank, which has extremely good performance after 2006, even during the financial crisis of 2007-08.

Chart 3. Asset Structure of the Four Major Greek Banks



Inflation: inflation is the rate at which the general level of prices for goods and services is rising and, consequently, the purchasing power of currency is falling. Typically, is expressed as an annual percentage. Inflations is important for banks because they typically deal in nominal financial instruments, and the payments of these instruments are fixed in nominal value. These instruments make up an important size of a bank's assets and liabilities.[37]

Chart 4 shows the inflation in Greece for the period 2001-2015. Since 2001 inflation has decreased from 4.5% in 2001 to 2.2% at the end of 2008. In 2009, inflation reached 0.7% and from 2013 inflation is negative, with lower price at -2.5% in December 2014. In December 2015 inflation was positive at 0.4%.

[37] https://research.stlouisfed.org/publications/review/86/03/Effects_Mar1986.pdf?ref=HadiZayifla.Com p. 15

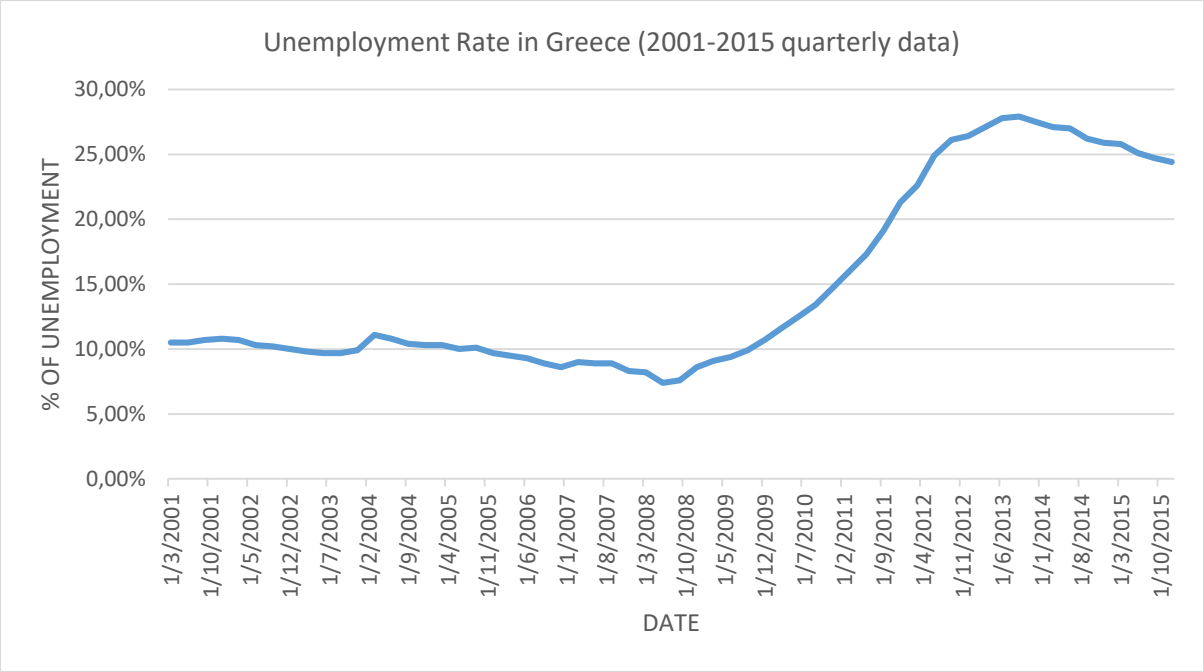
Chart 4. Inflation in Greece for the period 2001-2015.

Unemployment: Unemployment is a phenomenon that occurs when a person who is actively searching for employment is unable to find work.[38] High unemployment is associated with lower levels of economic activity which has negative impact on banks. The risk that the borrower will default on their loans increase and the money supply of the bank reduces.

Chart 5 shows the unemployment rate in Greece during the period 2001 to 2015. Generally, unemployment in Greece was about 9%-10%, the lower value was in September 2008 (7.2%). After the financial crisis of 2008 unemployment in Greece has reached very high unemployment rates such as 27.9% in September 2013. Since then unemployment has decreased slowly to 24.4% in December 2015.

[38] http://www.investopedia.com/terms/u/unemployment.asp

Chart 5. Unemployment Rate in Greece for the period 2001-2015.



Some difficulties related to this study include the availability and reliability of the data. It is worth to mention that banks' data in some circumstances differ from official data of other sources. Also, data for the period before 2006 are not available for all banks or may be not included in every financial statement. Consequently, we have to assume that Greek banks' data are unreliable to some extent.

Possible methodological limitations include the sample size. This study uses the four major Greek banks (NBG, Piraeus Bank, Alpha Bank and Eurobank Ergasias), while the total number of credit institutions incorporated in Greece for 2015 is 17.[39] For that reason quarterly data were used for the period 2001-2015 and not annually.

Data analysis

The data came from Bankscope database, ThomsonOne database and the banks' annual and quarterly reports. The test includes the four largest Greek banks, and 280 observations, with total assets 371.921 billion or almost 90 percent of the Greek banking system. The financial data were generated using the Stata tools. The data are quarterly and cover the period from 2001 to 2015.

[39] "List of credit institutions authorized in Greece"

In order to decide between fixed and random effects we can run a Hausman test on Stata, where the null hypothesis is that the preferred model is random effects vs. the alternative the fixed effects. In tables 4, 6 you can see the results of fixed-effects model and random effects model respectively.

Table 4. Fixed Effects Model

R-sq	0.1614					
F(6, 230)	7.38					
Prob > F	0.0000					
CAR	Coefficient	Standard Error	t	P>|t|	95% Conf. Interval	
ROE	-0.0000564	0.0000358	-1.58	0.116	-0.0001269	0.0000141
Net Interest Margin	0.1564495	0.1619999	0.97	0.335	-0.162744	0.4756429
Asset Structure	-0.0002292	0.0003061	-0.75	0.455	-0.0008324	0.0003739
NPLs	0.3010309	0.0494758	6.08	0.000	0.2035471	0.3985147
Unemployment	-0.366704	0.0618479	-5.93	0.000	-0.4886412	-0.2449196
Inflation	0.1647624	0.1388176	1.19	0.236	-0.1087543	0.4382791
_cons	0.1308028	0.0075363	17.36	0.000	0.1159537	0.1456519
F test		F (3, 230) = 2.65		Prob > F =0.0494		

On table 5 you can see the Hausman test results. The Prob>chi2=0.9969, this is more than 0.05 (i.e not significant) so we use random effects model.

Table 5. Hausman test

	(b) Fixed	(B) Random	(b-B) Difference	Sqrt (diag (V_b-V_B)) S.E.
ROE	-0.0000541	-0.0000452	-8.89e-06	
Net Interest Margin	0.0559636	0.0180631	0.0379005	0.1061899
Asset Structure	-0.0398027	-0.0335847	-0.0062181	0.012351
NPLs	0.2681107	0.2698885	-0.0017779	0.0075393
Unemployment	-0.3259533	-0.3262442	0.0002909	0.0106086

Inflation	0.1174593	0.1252491	-0.0077898	
Prob>chi2		0.9969		

Table 6 exhibits the results of the regression. P-value is the probability of obtaining an effect at least as extreme as the one in our sample data. Two-tail p-values test the hypothesis that each coefficient is different from zero. To reject this, the p-value has to be lower than 0.05 (for 95% confidence interval). If this is the case, then the variable has a significant influence on the dependent variable. As we can see from table 1, the Wald chi2 is 49.92 and the probability value is zero. It means that all the coefficients of this model are different from zero and the model is nicely fitted.

From the same table we can see the p-values for all the coefficients. It can be seen that the return on equity (ROE) has a p-value of 0.205 or 20.5% that is greater than a=0.05, and the null hypothesis is not rejected. It means that ROE is not a significant variable to explain the capital adequacy ratio of Greek banks, that is it does not directly affect the level of banks' capital. The insignificance of return on equity is consistent with other studies about banks' capital adequacy. Emilia Klepczarek, Determinant of European Banks' Capital Adequacy, finds a ROE with a low value, so it is not analysed.

Table 6. Random-Effect Model

R-sq	0.1729					
Wald chi2 (5)	49.92					
Prob > chi2	0.0000					
CAR	Coefficient	Standard Error	z	P>|z|	95% Conf. Interval	
ROE	-0.0000452	0.0000357	-1.27	0.205	-0.0001152	0.0000247
Net Interest Margin	0.0180631	0.1310147	0.14	0.890	-0.2787209	0.2748472
Asset Structure	-0.0335847	0.0156074	-2.15	0.031	-0.0641746	-0.0029948
NPLs	0.2698885	0.0511829	5.27	0.000	0.1695719	0.3702052
Unemployment	-0.3262442	0.0638598	-5.11	0.000	-0.4514071	-0.2010812

Inflation	0.1252491	0.1399626	0.89	0.371	-0.1490725	0.3995707
_cons	0.1538216	0.0130881	11.75	0.000	0.1281694	0.1794739

Net interest margin has a positive sign which is consistent with the past empirical findings, that high earnings provides banks managers easy access to equity capital and self-regulatory incentives to minimize the taking risk. Although, NIM has a p-value 0.890 that is higher than a=0.05, so the net interest margin is insignificant variable, that is it does not directly affect the level of Greek bank's capital adequacy.

The regression result shows that there is a negative relationship between loans/total assets and the capital adequacy ratio. The p-value is 0.031, lower than a=0.05 and that means that the asset structure variable is significant and affect directly the level of capital adequacy ratio of Greek banks. That is, if the asset structure ratio increases by 1% the capital level is expected to decrease by 0.3262 on average, holding other variables constant.

Non-performing loans is an important indicator of banks' healthy solvency ratio. High NPLs ratio signifies a riskier bank. The empirical result indicates the significantly positive correlation between capital adequacy ratio and non-performing loans. Particularly the p-value=0.00 which is remarkably smaller than a=0.05 indicates that the NPLs variable affects directly the level of capital adequacy ratio of banks. In other words, since the NPLs ratio grows by 1% the capital level is expected to increase by 0.27% on average, holding other variables constant.

The statistical analysis reveals the significant negative relationship between capital adequacy ratio and unemployment. Particularly, the p-value is zero which is smaller than a=0.05. It means that the unemployment affects directly the level of capital adequacy ratio of Greek banks. When unemployment drops 1% the banks' capital level will experience an increase by 0.3262 on average.

Finally, the regression result show that there is a positive relationship between inflation and the level of capital adequacy ratio. But, as we can see the p-value is 0.233, higher than a=0.05, which consequently means that the unemployment variable is insignificant and does not affect directly the capital adequacy ratio of Greek banks.

R-square shows the amount of variance of dependent variable explained by independent variables. In our case the R-square is 17,29 percent. Adjusted R-square shows the same as R-square but adjusted by the number of cases and number of variables. When the number of variables is small and the number of cases is very large then adjusted R-square is closer to R-square.

Table 7 shows the results of the summary statistics. The number of observations is 240 for all variables. The mean is the average of the data and it is used as a standard measure of the centre of the distribution of the data. The mean is greatly affected by unusual values (outliers). As we can see the mean for our variables lies between 0.0110221 and 0.1483667. Return on Equity is an exception as it has a negative value of -2.810978, which is justified by the unusual negative values for some quarters for all banks.

Standard deviation shows how spread out the data are about the mean. A high value indicates greater spread in the data, correspondingly a low value indicates lower spread in the data. As we can see ROE has an extremely high standard deviation. But as we have mention before this is due to the existence of outliers in the data. Another variable with high standard deviation is the ratio of loans in total assets, followed by unemployment, inflation, net interest margin, NPLs, and capital adequacy ratio.

On the same table we can see the minimum and maximum values. Minimum is the smallest data value while maximum is the largest data value. Again, return on equity has remarkably low minimum value (-616.5357) and it is explained by the presents of outliers in the data.

Table 7. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
CAR	240	0.1201929	0.0232934	0.043	0.2663
ROE	240	-2.810978	39.92346	-616.5357	16.4
Net Interest Margin	240	0.0110221	0.114363	-0.0031	0.0891
Asset Structure	240	0.9743746	4.57185	0.395	71.49
NPLs	240	0.1273617	0.1051853	0.046	0.345
Unemployment	240	0.1483667	0.722112	0.074	0.279
Inflation	240	0.0231167	0.206441	-0.025	0.057

Table 8 presents the Breusch-Pagan test for heteroscedasticity. So, the Breusch-Pagan test produces a chi2 test statistic with 6 degrees of freedom when the null hypothesis of no heteroscedasticity is satisfied. That test statistic in this particular case is 9.29 and the p-value is 15.77% so we cannot reject the null hypothesis of no heteroscedasticity.

Table 8. Breusch-Pagan Test for Heteroscedasticity.

chi2 (6)	9.29
Prob > chi2	0.1577

Table 9 is a correlation matrix that lists the variable names down the first column and across the first row. The value of 1 in absolute terms, means that there is a perfect positive or negative correlation between two variables. The diagonal of a correlation matrix always consists of ones, because there are the correlations between each variable and itself. The absolute value between 0.80-0.99 indicates a strong relationship between the variables, a value between 0.5-0.79 indicates moderate relationship, 0.3-0.49 indicates weak relationship between two variables and 0-0.29 indicates possible relationship between the variables.

As we can see from table 9 probably there is no connection between the variables. Only between unemployment and non-performing loans there is a strong positive relationship, meaning that 94.7 percent of variance in non-performing loans is explained by variance in unemployment. Also, there is a strong negative relationship between non-performing loans and inflation (-87.37%) and between unemployment and inflation (-81.78%).

Table 9. Correlation Matrix

	CAR	ROE	NIM	ASS.STRUCT	NPLs	UNEMPL	INFLAT
CAR	1.0000						
ROE	-0.0146	1.0000					
NIM	0.0224	0.0458	1.0000				
ASSET. STRUCT	-0.0661	0.0036	-0.0464	1.0000			
NPLs	0.1650	-0.0464	0.0540	-0.0299	1.0000		
UNEMPL	0.0491	-0.1056	0.0884	-0.0272	0.9470	1.0000	
INFLAT	-0.1207	0.0495	-0.0258	0.0483	-0.9737	-0.8178	1.0000

Subsample analysis: the impact of the financial crisis

The financial crisis of 2007-08 has changed the world's financial landscape. It has been set clear that the risks were mispriced, the regulatory frameworks for financial institutions did not work as expected and people's awareness of what is a banking crisis and the implications on the economy increased. In this thesis we have created a subsample analysis to include the impact of financial crisis, in order to conclude whether the results are affected by the or not by the current financial crisis.

In order to examine the impact of the financial crisis on capital adequacy ratio of Greek banks, we use as reference point the level of the Athens Stock Exchange General Index. We have used the historical prices of the index with quarterly frequency for the period 2001 to 2015. The prices are divided into two groups. The first group includes data from 2001 to 2007 (that is just before the financial crisis) and the second group includes data after the financial crisis of 2008.

The following regression is being considered:

$$Y_{i,t} = \beta_0 + \beta_1 NPL_{i,t} + \beta_3 ROE_{i,t} + \beta_4 NIM_{i,t} + \beta_6 ASSTRCTR_{i,t} + \beta_7 Inflation_t + \beta_8 Umemployment_t + \beta_9 Fincrisis_{i,t} + \varepsilon_t$$

Where Y_t is the capital ratio of four major Greek banks (NBG, Piraeus Bank, Alpha Bank, Eurobank Ergasias) at time t; $NPL_{i,t}$ is the ratio of non-performing loans to gross loans of bank i at time t; $NIM_{i,t}$ is the net interest margin of bank i at time t; $ASSTRCTR_{i,t}$ is the asset structure (total assets to loans) of bank i at time t; $Inflation_t$ is the country's inflation at time t; $Umemployment_t$ is the country's unemployment at time t; Fincrisis is a binary (dummy) variable that indicates the absence or existence of financial crisis; and ε_t is the error term.

It is assumed that the pre financial crisis price index represents a healthy financial sector, without disruptions in the economy. After 2008 the price level of the general index gradually decreased and incorporated the impact of the financial crisis. So, we assume that the price level of the Athens Stock Exchange General Index is directly connected with the financial crisis. The existence of the financial disruption is displayed by the price index of the Athens Stock Exchange General. The average price of the index before the crisis is used as an

indicator of economic growth and development, and the average price of the index after 2008 depicts the impact of the crisis.

Table 10, shows the results of the new regression. In this regression we have added the impact of the financial crisis on the capital adequacy ratio. Financial crisis is illustrated with a binary (dummy) variable. The binary variable takes the value 0 or1 to indicate the absence or the presence of financial crisis. When the price of the Athens Stock Exchange General Index is higher than the average index price before the year 2007 there is no financial crisis, If the price of the Athens Stock Exchange General Index is lower than the average index price before the year 2007 then it indicates the existence of a crisis.

As we can see the R squared is 18.38% higher than in the previous regression (17,29%). As we said before p-value test the hypothesis that each coefficient is different from zero. ROE has a p-value 0.211 which is higher than 0.05, so we reject the null hypothesis and accept that the variable has not influence on the dependent variable. Net Interest Margin has p-value of 0.737, that is, it has no impact on the capital adequacy ratio.

Asset structure has a p-value of 0.020 which is lower than 0.05, and we can say state that the variable has a significant influence on the dependent variable. Non-performing loans and inflation have a p-value equal to zero, exactly as in the previous regression. P-value is lower than 0.05, so the variables are significant and have influence on capital adequacy ratio of Greek banks. In other words, since the assets structure ratio grows by 1% the capital level is expected to decrease by 0.0365 on average, holding other variables constant.

Table 10. Random Effects Model

R-sq	0.1838					
Wald chi2 (5)	50.24					
Prob > chi2	0.0000					
CAR	Coefficient	Standard Error	z	P>|z|	95% Conf. Interval	
ROE	-0.0000444	0.0000355	-1.25	0.211	-0.0001141	0.0000252
Net Interest Margin	0.0440989	0.1314944	0.34	0.737	-0.2136253	0.3018231
Asset Structure	-0.0365592	0.0156554	-2.34	0.020	-0.0672432	-0.0058752

NPLs	0.2604469	0.0513188	5.08	0.000	0.159864	0.3610299
Unemployment	-0.2970865	0.0660512	-4.50	0.000	-0.4265445	-0.1676285
Inflation	0.1183413	0.1395166	0.85	0.396	-0.1551061	0.3917888
Fincrisis	-0.0060235	0.0036625	-1.64	0.100	-0.0011548	0.0132017
_cons	0.150988	0.0131538	11.48	0.000	0.125207	0.1767691

Conclusions and Further Research

Banks are required by legislation to maintain minimum capital level. As a result of 2007 financial crisis banks are required to hold higher levels of higher quality capital in order to reduce the probability of bankruptcy.

In this thesis we have examined the determinants of capital adequacy ratio in Greece using quarterly data for the period 2001 to 2015. We have set the capital adequacy ratio as the dependent variable and other six variables as independent variables, namely, return on equity, net interest margin, asset structure (loans/total assets), non-performing loans and two macroeconomic indicators, unemployment and inflation. Two variables, non-performing loans and unemployment, have been found statistically significant to explain the capital adequacy ratio. Non-performing loans have a positive association with capital adequacy ratio while unemployment has negative.

Greek banks operate in a country with severe economic difficulties that cannot affect its profitability and solvency. Until today Greece continues to face significant and essential challenges such as high unemployment rate, which reached at levels that the country had never experienced after entry in the European Union, low or negative growth rate that can be reversed by creating jobs and by shifting the economy from consumption to exports and investment.

Further research could include more banks and variables, such as share of deposits, GDP growth rate, and total equity to total liabilities.

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Appendix

Bank Name	Year	CAR	ROE	Net Interest Margin	Asset Structure	NPLs	Unemploymen t	Inflation	FTSE/ATHEX Large Cap	unit_id
NBG	31/12/2015	14,6%	-55,15%	-0,31%	45,39%	34,35%	24,40%	0,40%	1883,50	1
NBG	30/9/2015	9,6%	-44,77%	0,53%	63,41%	34,50%	24,70%	-0,80%	1822,60	1
NBG	30/6/2015	9,5%	-36,58%	0,52%	64,41%	34,40%	25,10%	-1,10%	2495,20	1
NBG	31/3/2015	12,1%	-3,89%	0,52%	63,49%	34,00%	25,80%	-1,90%	2564,50	1
NBG	31/12/2014	13,6%	0,94%	0,57%	64,10%	33,77%	25,90%	-2,50%	3118,80	1
NBG	30/9/2014	15,9%	23,37%	0,56%	65,15%	33,40%	26,20%	-1,10%	3771,20	1
NBG	30/6/2014	16,3%	21,27%	0,54%	65,45%	32,90%	27,00%	-1,50%	3979,90	1
NBG	31/3/2014	10,5%	90,11%	0,52%	64,42%	32,50%	27,10%	-1,50%	4175,50	1
NBG	31/12/2013	11,2%	49,76%	0,54%	64,59%	31,90%	27,50%	-1,80%	3958,50	1
NBG	30/9/2013	9,2%	152,67%	0,54%	65,31%	29,30%	27,90%	-1,00%	3082,10	1
NBG	30/6/2013	9,2%	20,83%	0,60%	65,46%	28,10%	27,80%	-0,20%	3457,60	1
NBG	31/3/2013	9,5%	20,83%	0,58%	71,05%	26,70%	27,10%	-0,20%	3352,40	1
NBG	31/12/2012	9,2%	20,83%	2,16%	70,79%	23,30%	26,40%	0,30%	2800,00	1
NBG	30/9/2012	9,2%	-845,49%	2,16%	71,10%	21,40%	26,10%	0,30%	2341,00	1
NBG	30/6/2012	9,3%	-634,13%	2,16%	72,03%	18,90%	24,90%	1,00%	1893,10	1
NBG	31/3/2012	8,1%	-404,06%	2,16%	71,50%	16,50%	22,60%	1,30%	3044,50	1
NBG	31/12/2011	11,3%	-382,31%	0,66%	71,80%	14,40%	21,30%	2,20%	2691,60	1
NBG	30/9/2011	12,2%	-15,48%	0,62%	67,97%	13,30%	19,10%	2,90%	3829,20	1
NBG	30/6/2011	10,8%	-13,02%	0,65%	68,00%	12,10%	17,30%	3,10%	5866,40	1
NBG	31/3/2011	9,9%	6,96%	0,65%	67,35%	10,20%	16,00%	4,30%	7380,30	1
NBG	31/12/2010	13,7%	5,34%	0,65%	66,96%	9,10%	14,70%	5,20%	6703,20	1
NBG	30/9/2010	13,1%	2,58%	0,64%	68,30%	8,90%	13,40%	5,70%	7574,50	1
NBG	30/6/2010	13,1%	5,02%	0,65%	67,94%	8,20%	12,50%	5,20%	7447,50	1
NBG	31/3/2010	11,1%	9,36%	0,67%	70,03%	7,80%	11,60%	3,90%	9550,70	1
NBG	31/12/2009	11,3%	13,88%	0,69%	68,83%	7,00%	10,70%	2,50%	11842,10	1
NBG	30/9/2009	12,2%	17,83%	0,67%	71,59%	6,60%	9,90%	0,70%	13048,40	1
NBG	30/6/2009	10,5%	20,81%	0,67%	69,17%	5,50%	9,40%	0,70%	12203,10	1
NBG	31/3/2009	10,5%	24,72%	0,68%	72,50%	5,00%	9,10%	1,50%	7551,30	1
NBG	31/12/2008	10,3%	25,66%	0,71%	74,12%	4,70%	8,60%	2,20%	9904,80	1
NBG	30/9/2008	10,9%	23,08%	0,71%	66,45%	4,60%	7,60%	4,70%	18005,70	1
NBG	30/6/2008	10,7%	25,74%	0,74%	66,52%	4,70%	7,40%	4,90%	22104,00	1
NBG	31/3/2008	9,7%	27,87%	0,74%	65,89%	4,60%	8,20%	4,40%	21115,40	1
NBG	31/12/2007	9,2%	24,88%	0,72%	63,23%	4,60%	8,30%	3,90%	27087,70	1
NBG	30/9/2007	17,1%	23,43%	0,72%	62,32%	4,70%	8,90%	3,00%	26367,50	1
NBG	30/6/2007	10,6%	29,08%	0,72%	63,42%	4,80%	8,90%	2,60%	26666,50	1
NBG	31/3/2007	10,6%	24,81%	0,71%	62,62%	5,10%	9,00%	2,80%	24409,90	1
NBG	31/12/2006	15,6%	20,37%	0,71%	58,98%	5,40%	8,60%	3,20%	23176,10	1
NBG	30/9/2006	26,6%	22,93%	0,63%	61,25%	5,50%	8,90%	3,10%	21125,50	1
NBG	30/6/2006	16,4%	34,40%	0,60%	58,86%	5,90%	9,30%	3,40%	19996,90	1
NBG	31/3/2006	16,4%	28,58%	0,56%	57,10%	6,00%	9,50%	3,30%	23387,80	1

NBG	31/12/2005	15,2%	26,55%	0,49%	51,68%	6,20%	9,70%	3,50%	19138,40	1
NBG	30/9/2005	16,8%	22,54%	0,49%	50,03%	6,30%	10,10%	3,80%	18147,70	1
NBG	30/6/2005	14,9%	17,96%	0,49%	49,95%	6,50%	10,00%	3,20%	16569,40	1
NBG	31/3/2005	14,9%	14,20%	0,49%	48,50%	6,80%	10,30%	2,80%	17555,50	1
NBG	31/12/2004	14,8%	16,51%	3,00%	47,81%	7,00%	10,30%	3,10%	14549,80	1
NBG	30/9/2004	15,6%	18,43%	3,00%	45,02%	6,90%	10,40%	2,90%	12413,60	1
NBG	30/6/2004	13,3%	16,92%	3,00%	45,38%	7,00%	10,80%	3,00%	12818,40	1
NBG	31/3/2004	13,3%	16,39%	3,00%	44,20%	6,90%	11,10%	2,90%	12755,30	1
NBG	31/12/2003	12,9%	9,70%	0,48%	43,04%	7,00%	9,90%	3,10%	11002,00	1
NBG	30/9/2003	12,9%	9,70%	0,45%	43,65%	7,10%	9,70%	3,30%	11210,10	1
NBG	30/6/2003	12,9%	9,70%	0,45%	40,50%	7,15%	9,70%	3,70%	8541,40	1
NBG	31/3/2003	12,9%	9,70%	0,45%	40,98%	7,20%	9,80%	3,90%	7871,70	1
NBG	31/12/2002	10,4%	9,78%	2,60%	41,25%	7,20%	10,00%	3,50%	9146,10	1
NBG	30/9/2002	12,6%	9,78%	2,60%	42,50%	6,90%	10,20%	3,80%	10827,80	1
NBG	30/6/2002	12,6%	9,78%	2,60%	40,70%	6,30%	10,30%	3,60%	12179,60	1
NBG	31/3/2002	12,6%	9,78%	2,60%	40,30%	5,80%	10,70%	4,30%	12640,40	1
NBG	31/12/2001	10,2%	15,04%	2,40%	40,65%	5,60%	10,80%	3,50%	14685,80	1
NBG	30/9/2001	11,3%	15,04%	2,40%	39,50%	5,40%	10,70%	4,00%	15449,20	1
NBG	30/6/2001	11,7%	15,04%	2,40%	40,41%	5,30%	10,50%	4,50%	18207,90	1
NBG	31/3/2001	11,7%	15,04%	2,40%	39,56%	5,00%	10,50%	3,20%	17879,80	1
Piraeus Bank	31/12/2015	17,8%	-25,1%	0,41%	61,58%	34,35%	24,40%	0,40%	1883,50	2
Piraeus Bank	30/9/2015	11,3%	31,7%	0,45%	64,26%	34,50%	24,70%	-0,80%	1822,60	2
Piraeus Bank	30/6/2015	10,2%	-39,9%	0,45%	64,30%	34,40%	25,10%	-1,10%	2495,20	2
Piraeus Bank	31/3/2015	12,0%	-24,7%	0,45%	66,13%	34,00%	25,80%	-1,90%	2564,50	2
Piraeus Bank	31/12/2014	12,5%	-26,4%	0,45%	67,36%	33,77%	25,90%	-2,50%	3118,80	2
Piraeus Bank	30/9/2014	13,6%	-27,8%	0,44%	68,09%	33,40%	26,20%	-1,10%	3771,20	2
Piraeus Bank	30/6/2014	15,0%	-11,3%	0,44%	69,02%	32,90%	27,00%	-1,50%	3979,90	2
Piraeus Bank	31/3/2014	14,5%	-30,5%	0,41%	69,12%	32,50%	27,10%	-1,50%	4175,50	2
Piraeus Bank	31/12/2013	14,0%	98,1%	0,39%	69,96%	31,90%	27,50%	-1,80%	3958,50	2
Piraeus Bank	30/9/2013	13,6%	108,6%	0,38%	69,87%	29,30%	27,90%	-1,00%	3082,10	2
Piraeus Bank	30/6/2013	14,0%	103,1%	0,35%	69,49%	28,10%	27,80%	-0,20%	3457,60	2
Piraeus Bank	31/3/2013	15,2%	84,3%	0,31%	73,69%	26,70%	27,10%	-0,20%	3352,40	2
Piraeus Bank	31/12/2012	12,2%	-93,7%	0,30%	75,06%	23,30%	26,40%	0,30%	2800,00	2
Piraeus Bank	30/9/2012	13,0%	-194,8%	0,32%	76,85%	21,40%	26,10%	0,30%	2341,00	2
Piraeus Bank	30/6/2012	13,0%	-61653,6%	0,35%	74,23%	18,90%	24,90%	1,00%	1893,10	2
Piraeus Bank	31/3/2012	9,0%	-696,3%	0,35%	73,59%	16,50%	22,60%	1,30%	3044,50	2
Piraeus Bank	31/12/2011	9,7%	-4298,5%	0,39%	72,50%	14,40%	21,30%	2,20%	2691,60	2
Piraeus Bank	30/9/2011	8,8%	-45,8%	0,43%	65,22%	13,30%	19,10%	2,90%	3829,20	2
Piraeus	30/6/2011	9,5%	-30,2%	0,41%	67,45%	12,10%	17,30%	3,10%	5866,40	2

Bank										
Piraeus Bank	31/3/2011	11,6%	-0,8%	0,41%	68,20%	10,20%	16,00%	4,30%	7380,30	2
Piraeus Bank	31/12/2010	11,2%	-0,7%	0,40%	69,08%	9,10%	14,70%	5,20%	6703,20	2
Piraeus Bank	30/9/2010	9,7%	-0,1%	0,41%	70,60%	8,90%	13,40%	5,70%	7574,50	2
Piraeus Bank	30/6/2010	9,7%	2,8%	0,40%	71,86%	8,20%	12,50%	5,20%	7447,50	2
Piraeus Bank	31/3/2010	9,8%	5,3%	0,40%	71,49%	7,80%	11,60%	3,90%	9550,70	2
Piraeus Bank	31/12/2009	9,8%	7,9%	0,42%	72,14%	7,00%	10,70%	2,50%	11842,10	2
Piraeus Bank	30/9/2009	10,3%	9,5%	0,42%	73,64%	6,60%	9,90%	0,70%	13048,40	2
Piraeus Bank	30/6/2009	11,2%	8,6%	0,41%	71,30%	5,50%	9,40%	0,70%	12203,10	2
Piraeus Bank	31/3/2009	10,0%	7,6%	0,36%	74,04%	5,00%	9,10%	1,50%	7551,30	2
Piraeus Bank	31/12/2008	9,9%	11,0%	0,43%	74,74%	4,70%	8,60%	2,20%	9904,80	2
Piraeus Bank	30/9/2008	10,0%	18,8%	0,45%	76,95%	4,60%	7,60%	4,70%	18005,70	2
Piraeus Bank	30/6/2008	10,5%	18,3%	0,46%	73,27%	4,70%	7,40%	4,90%	22104,00	2
Piraeus Bank	31/3/2008	10,8%	18,0%	0,43%	76,09%	4,60%	8,20%	4,40%	21115,40	2
Piraeus Bank	31/12/2007	12,2%	29,5%	0,48%	71,63%	4,60%	8,30%	3,90%	27087,70	2
Piraeus Bank	30/9/2007	10,0%	18,8%	0,45%	80,40%	4,70%	8,90%	3,00%	26367,50	2
Piraeus Bank	30/6/2007	9,8%	36,0%	0,46%	74,63%	4,80%	8,90%	2,60%	26666,50	2
Piraeus Bank	31/3/2007	11,1%	32,2%	0,41%	88,68%	5,10%	9,00%	2,80%	24409,90	2
Piraeus Bank	31/12/2006	11,3%	29,0%	0,57%	75,31%	5,40%	8,60%	3,20%	23176,10	2
Piraeus Bank	30/9/2006	11,5%	29,9%	0,50%	80,61%	5,50%	8,90%	3,10%	21125,50	2
Piraeus Bank	30/6/2006	10,3%	21,8%	0,53%	73,30%	5,90%	9,30%	3,40%	19996,90	2
Piraeus Bank	31/3/2006	11,3%	26,4%	0,48%	81,89%	6,00%	9,50%	3,30%	23387,80	2
Piraeus Bank	31/12/2005	11,0%	21,0%	-0,16%	75,34%	6,20%	9,70%	3,50%	19138,40	2
Piraeus Bank	30/9/2005	11,1%	19,5%	0,89%	71,25%	6,30%	10,10%	3,80%	18147,70	2
Piraeus Bank	30/6/2005	10,7%	19,3%	0,89%	74,99%	6,50%	10,00%	3,20%	16569,40	2
Piraeus Bank	31/3/2005	12,1%	18,8%	0,90%	72,27%	6,80%	10,30%	2,80%	17555,50	2
Piraeus Bank	31/12/2004	13,4%	14,4%	0,88%	73,62%	7,00%	10,30%	3,10%	14549,80	2
Piraeus Bank	30/9/2004	12,0%	14,9%	0,89%	72,50%	6,90%	10,40%	2,90%	12413,60	2
Piraeus Bank	30/6/2004	9,7%	15,9%	0,88%	76,30%	7,00%	10,80%	3,00%	12818,40	2
Piraeus Bank	31/3/2004	10,0%	13,9%	0,46%	74,65%	6,90%	11,10%	2,90%	12755,30	2
Piraeus Bank	31/12/2003	11,2%	12,5%	0,45%	72,59%	7,00%	9,90%	3,10%	11002,00	2
Piraeus Bank	30/9/2003	10,5%	13,9%	0,43%	70,60%	7,10%	9,70%	3,30%	11210,10	2
Piraeus Bank	30/6/2003	11,1%	12,5%	0,44%	71,65%	7,15%	9,70%	3,70%	8541,40	2
Piraeus Bank	31/3/2003	10,8%	13,0%	0,44%	72,98%	7,20%	9,80%	3,90%	7871,70	2
Piraeus Bank	31/12/2002	11,0%	11,1%	0,43%	67,30%	7,20%	10,00%	3,50%	9146,10	2

Piraeus Bank	30/9/2002	11,9%	12,0%	0,41%	66,50%	6,90%	10,20%	3,80%	10827,80	2
Piraeus Bank	30/6/2002	12,0%	11,1%	0,44%	62,30%	6,30%	10,30%	3,60%	12179,60	2
Piraeus Bank	31/3/2002	10,6%	14,1%	0,41%	63,80%	5,80%	10,70%	4,30%	12640,40	2
Piraeus Bank	31/12/2001	11,9%	14,5%	0,42%	62,30%	5,60%	10,80%	3,50%	14685,80	2
Piraeus Bank	30/9/2001	11,9%	14,8%	0,40%	61,30%	5,40%	10,70%	4,00%	15449,20	2
Piraeus Bank	30/6/2001	12,6%	15,3%	0,39%	61,80%	5,30%	10,50%	4,50%	18207,90	2
Piraeus Bank	31/3/2001	10,0%	15,9%	0,40%	60,90%	5,00%	10,50%	3,20%	17879,80	2
Alpha Bank	31/12/2015	16,8%	-16,5%	0,55%	74,21%	34,35%	24,40%	0,40%	1883,50	3
Alpha Bank	30/9/2015	12,6%	-16,8%	0,54%	74,71%	34,50%	24,70%	-0,80%	1822,60	3
Alpha Bank	30/6/2015	14,4%	-24,6%	0,53%	75,14%	34,40%	25,10%	-1,10%	2495,20	3
Alpha Bank	31/3/2015	13,3%	-4,4%	0,63%	75,62%	34,00%	25,80%	-1,90%	2564,50	3
Alpha Bank	31/12/2014	14,7%	-4,4%	0,52%	75,57%	33,77%	25,90%	-2,50%	3118,80	3
Alpha Bank	30/9/2014	15,8%	7,3%	0,52%	76,68%	33,40%	26,20%	-1,10%	3771,20	3
Alpha Bank	30/6/2014	16,6%	15,6%	0,50%	77,38%	32,90%	27,00%	-1,50%	3979,90	3
Alpha Bank	31/3/2014	14,6%	-12,6%	0,60%	76,06%	32,50%	27,10%	-1,50%	4175,50	3
Alpha Bank	31/12/2013	16,4%	83,0%	0,49%	76,50%	31,90%	27,50%	-1,80%	3958,50	3
Alpha Bank	30/9/2013	13,9%	63,2%	0,44%	77,54%	29,30%	27,90%	-1,00%	3082,10	3
Alpha Bank	30/6/2013	14,2%	61,1%	0,42%	77,64%	28,10%	27,80%	-0,20%	3457,60	3
Alpha Bank	31/3/2013	11,7%	144,1%	0,40%	82,91%	26,70%	27,10%	-0,20%	3352,40	3
Alpha Bank	31/12/2012	9,1%	-1444,5%	0,38%	77,58%	23,30%	26,40%	0,30%	2800,00	3
Alpha Bank	30/9/2012	9,7%	-226,3%	0,61%	78,90%	21,40%	26,10%	0,30%	2341,00	3
Alpha Bank	30/6/2012	10,3%	-203,8%	0,67%	79,50%	18,90%	24,90%	1,00%	1893,10	3
Alpha Bank	31/3/2012	4,3%	-139,1%	0,59%	80,36%	16,50%	22,60%	1,30%	3044,50	3
Alpha Bank	31/12/2011	4,6%	-160,5%	0,56%	80,93%	14,40%	21,30%	2,20%	2691,60	3
Alpha Bank	30/9/2011	12,5%	-14,0%	0,52%	79,14%	13,30%	19,10%	2,90%	3829,20	3
Alpha Bank	30/6/2011	12,3%	-11,9%	0,49%	79,24%	12,10%	17,30%	3,10%	5866,40	3
Alpha Bank	31/3/2011	13,4%	2,2%	0,50%	78,98%	10,20%	16,00%	4,30%	7380,30	3
Alpha Bank	31/12/2010	13,5%	2,0%	0,50%	77,36%	9,10%	14,70%	5,20%	6703,20	3
Alpha Bank	30/9/2010	13,1%	2,1%	0,48%	81,25%	8,90%	13,40%	5,70%	7574,50	3
Alpha Bank	30/6/2010	13,1%	4,6%	0,49%	82,03%	8,20%	12,50%	5,20%	7447,50	3
Alpha Bank	31/3/2010	12,8%	6,9%	0,48%	80,48%	7,80%	11,60%	3,90%	9550,70	3
Alpha Bank	31/12/2009	13,2%	9,4%	0,47%	80,90%	7,00%	10,70%	2,50%	11842,10	3
Alpha Bank	30/9/2009	11,6%	8,5%	0,49%	81,36%	6,60%	9,90%	0,70%	13048,40	3
Alpha Bank	30/6/2009	11,2%	9,5%	0,45%	77,56%	5,50%	9,40%	0,70%	12203,10	3
Alpha	31/3/2009	8,7%	12,4%	0,44%	78,33%	5,00%	9,10%	1,50%	7551,30	3

Bank										
Alpha Bank	31/12/2008	9,8%	16,0%	0,50%	81,63%	4,70%	8,60%	2,20%	9904,80	3
Alpha Bank	30/9/2008	12,8%	23,2%	0,56%	81,35%	4,60%	7,60%	4,70%	18005,70	3
Alpha Bank	30/6/2008	12,8%	26,2%	0,59%	84,69%	4,70%	7,40%	4,90%	22104,00	3
Alpha Bank	31/3/2008	13,6%	25,3%	0,58%	86,00%	4,60%	8,20%	4,40%	21115,40	3
Alpha Bank	31/12/2007	13,3%	27,8%	0,61%	83,53%	4,60%	8,30%	3,90%	27087,70	3
Alpha Bank	30/9/2007	12,2%	28,1%	0,59%	84,13%	4,70%	8,90%	3,00%	26367,50	3
Alpha Bank	30/6/2007	12,8%	28,1%	0,55%	84,34%	4,80%	8,90%	2,60%	26666,50	3
Alpha Bank	31/3/2007	13,6%	24,8%	0,52%	82,57%	5,10%	9,00%	2,80%	24409,90	3
Alpha Bank	31/12/2006	13,3%	22,2%	0,63%	73,63%	5,40%	8,60%	3,20%	23176,10	3
Alpha Bank	30/9/2006	11,6%	27,6%	0,55%	72,56%	5,50%	8,90%	3,10%	21125,50	3
Alpha Bank	30/6/2006	12,4%	27,5%	0,47%	71,72%	5,90%	9,30%	3,40%	19996,90	3
Alpha Bank	31/3/2006	13,2%	25,6%	0,40%	70,25%	6,00%	9,50%	3,30%	23387,80	3
Alpha Bank	31/12/2005	13,3%	23,9%	0,14%	68,45%	6,20%	9,70%	3,50%	19138,40	3
Alpha Bank	30/9/2005	14,0%	21,0%	0,72%	67,72%	6,30%	10,10%	3,80%	18147,70	3
Alpha Bank	30/6/2005	14,9%	19,6%	0,74%	70,90%	6,50%	10,00%	3,20%	16569,40	3
Alpha Bank	31/3/2005	11,1%	19,5%	0,77%	69,77%	6,80%	10,30%	2,80%	17555,50	3
Alpha Bank	31/12/2004	14,0%	18,3%	0,65%	70,36%	7,00%	10,30%	3,10%	14549,80	3
Alpha Bank	30/9/2004	14,7%	20,1%	0,68%	68,20%	6,90%	10,40%	2,90%	12413,60	3
Alpha Bank	30/6/2004	14,9%	24,6%	0,60%	67,30%	7,00%	10,80%	3,00%	12818,40	3
Alpha Bank	31/3/2004	15,1%	20,7%	0,60%	66,90%	6,90%	11,10%	2,90%	12755,30	3
Alpha Bank	31/12/2003	14,6%	18,2%	0,57%	67,20%	7,00%	9,90%	3,10%	11002,00	3
Alpha Bank	30/9/2003	13,1%	20,1%	0,58%	67,90%	7,10%	9,70%	3,30%	11210,10	3
Alpha Bank	30/6/2003	12,6%	22,3%	0,50%	66,50%	7,15%	9,70%	3,70%	8541,40	3
Alpha Bank	31/3/2003	10,4%	24,1%	0,55%	68,40%	7,20%	9,80%	3,90%	7871,70	3
Alpha Bank	31/12/2002	9,8%	19,7%	0,49%	69,00%	7,20%	10,00%	3,50%	9146,10	3
Alpha Bank	30/9/2002	9,3%	18,2%	0,45%	67,20%	6,90%	10,20%	3,80%	10827,80	3
Alpha Bank	30/6/2002	9,5%	15,1%	0,50%	66,84%	6,30%	10,30%	3,60%	12179,60	3
Alpha Bank	31/3/2002	9,0%	24,0%	0,63%	65,30%	5,80%	10,70%	4,30%	12640,40	3
Alpha Bank	31/12/2001	8,5%	26,4%	0,61%	66,10%	5,60%	10,80%	3,50%	14685,80	3
Alpha Bank	30/9/2001	9,5%	19,7%	0,58%	65,20%	5,40%	10,70%	4,00%	15449,20	3
Alpha Bank	30/6/2001	10,5%	18,9%	0,55%	64,50%	5,30%	10,50%	4,50%	18207,90	3
Alpha Bank	31/3/2001	10,0%	18,2%	0,53%	64,80%	5,00%	10,50%	3,20%	17879,80	3
Eurobank Ergasias	31/12/2015	14,7%	-23,2%	3,26%	58,07%	34,35%	24,40%	0,40%	1883,50	4
Eurobank Ergasias	30/9/2015	12,6%	-33,7%	3,54%	58,02%	34,50%	24,70%	-0,80%	1822,60	4

Eurobank Ergasias	30/6/2015	11,1%	-49,3%	3,43%	58,58%	34,40%	25,10%	-1,10%	2495,20	4
Eurobank Ergasias	31/3/2015	14,5%	-29,1%	3,09%	58,31%	34,00%	25,80%	-1,90%	2564,50	4
Eurobank Ergasias	31/12/2014	16,6%	-30,6%	3,11%	58,83%	33,77%	25,90%	-2,50%	3118,80	4
Eurobank Ergasias	30/9/2014	16,4%	-33,7%	3,39%	60,29%	33,40%	26,20%	-1,10%	3771,20	4
Eurobank Ergasias	30/6/2014	17,2%	-36,5%	3,35%	60,68%	32,90%	27,00%	-1,50%	3979,90	4
Eurobank Ergasias	31/3/2014	10,3%	-289,9%	3,22%	60,85%	32,50%	27,10%	-1,50%	4175,50	4
Eurobank Ergasias	31/12/2013	11,1%	-221,3%	2,82%	61,20%	31,90%	27,50%	-1,80%	3958,50	4
Eurobank Ergasias	30/9/2013	8,9%	-54,4%	3,00%	61,13%	29,30%	27,90%	-1,00%	3082,10	4
Eurobank Ergasias	30/6/2013	8,3%	73,8%	2,76%	67,98%	28,10%	27,80%	-0,20%	3457,60	4
Eurobank Ergasias	31/3/2013	8,9%	36,4%	2,50%	74,42%	26,70%	27,10%	-0,20%	3352,40	4
Eurobank Ergasias	31/12/2012	11,6%	-328,8%	2,99%	73,02%	23,30%	26,40%	0,30%	2800,00	4
Eurobank Ergasias	30/9/2012	11,8%	-837,7%	2,82%	70,74%	21,40%	26,10%	0,30%	2341,00	4
Eurobank Ergasias	30/6/2012	10,1%	656,3%	2,70%	71,50%	18,90%	24,90%	1,00%	1893,10	4
Eurobank Ergasias	31/3/2012	9,0%	-337,2%	2,73%	72,30%	16,50%	22,60%	1,30%	3044,50	4
Eurobank Ergasias	31/12/2011	12,0%	375,6%	3,58%	73,35%	14,40%	21,30%	2,20%	2691,60	4
Eurobank Ergasias	30/9/2011	10,4%	2,6%	3,20%	72,60%	13,30%	19,10%	2,90%	3829,20	4
Eurobank Ergasias	30/6/2011	10,0%	2,5%	3,30%	70,50%	12,10%	17,30%	3,10%	5866,40	4
Eurobank Ergasias	31/3/2011	12,4%	3,0%	3,00%	69,58%	10,20%	16,00%	4,30%	7380,30	4
Eurobank Ergasias	31/12/2010	11,7%	1,6%	3,47%	70,86%	9,10%	14,70%	5,20%	6703,20	4
Eurobank Ergasias	30/9/2010	11,9%	2,0%	3,20%	70,95%	8,90%	13,40%	5,70%	7574,50	4
Eurobank Ergasias	30/6/2010	11,8%	4,7%	3,50%	71,60%	8,20%	12,50%	5,20%	7447,50	4
Eurobank Ergasias	31/3/2010	12,2%	6,2%	3,40%	72,50%	7,80%	11,60%	3,90%	9550,70	4
Eurobank Ergasias	31/12/2009	12,7%	7,7%	3,63%	72,27%	7,00%	10,70%	2,50%	11842,10	4
Eurobank Ergasias	30/9/2009	12,7%	6,8%	0,51%	73,37%	6,60%	9,90%	0,70%	13048,40	4
Eurobank Ergasias	30/6/2009	12,1%	8,9%	0,52%	70,27%	5,50%	9,40%	0,70%	12203,10	4
Eurobank Ergasias	31/3/2009	11,3%	12,6%	0,48%	72,80%	5,00%	9,10%	1,50%	7551,30	4
Eurobank Ergasias	31/12/2008	12,4%	15,7%	8,91%	73,81%	4,70%	8,60%	2,20%	9904,80	4
Eurobank Ergasias	30/9/2008	11,0%	19,7%	0,57%	75,16%	4,60%	7,60%	4,70%	18005,70	4
Eurobank Ergasias	30/6/2008	11,3%	24,1%	0,57%	74,79%	4,70%	7,40%	4,90%	22104,00	4
Eurobank Ergasias	31/3/2008	11,3%	23,6%	0,58%	74,69%	4,60%	8,20%	4,40%	21115,40	4
Eurobank Ergasias	31/12/2007	12,2%	23,6%	0,61%	73,52%	4,60%	8,30%	3,90%	27087,70	4
Eurobank Ergasias	30/9/2007	13,2%	21,0%	0,60%	74,90%	4,70%	8,90%	3,00%	26367,50	4
Eurobank Ergasias	30/6/2007	10,6%	25,4%	0,60%	71,49%	4,80%	8,90%	2,60%	26666,50	4
Eurobank Ergasias	31/3/2007	9,6%	23,0%	0,58%	71,06%	5,10%	9,00%	2,80%	24409,90	4
Eurobank	31/12/2006	10,4%	23,2%	0,60%	68,85%	5,40%	8,60%	3,20%	23176,10	4

Ergasias										
Eurobank Ergasias	30/9/2006	11,9%	24,2%	0,60%	69,28%	5,50%	8,90%	3,10%	21125,50	4
Eurobank Ergasias	30/6/2006	12,6%	25,5%	0,60%	67,08%	5,90%	9,30%	3,40%	19996,90	4
Eurobank Ergasias	31/3/2006	12,9%	22,7%	0,58%	67,03%	6,00%	9,50%	3,30%	23387,80	4
Eurobank Ergasias	31/12/2005	13,5%	21,7%	2,60%	66,74%	6,20%	9,70%	3,50%	19138,40	4
Eurobank Ergasias	30/9/2005	11,0%	21,4%	0,62%	70,15%	6,30%	10,10%	3,80%	18147,70	4
Eurobank Ergasias	30/6/2005	10,9%	19,5%	0,62%	68,74%	6,50%	10,00%	3,20%	16569,40	4
Eurobank Ergasias	31/3/2005	10,5%	17,9%	0,66%	68,61%	6,80%	10,30%	2,80%	17555,50	4
Eurobank Ergasias	31/12/2004	10,6%	20,6%	3,10%	66,59%	7,00%	10,30%	3,10%	14549,80	4
Eurobank Ergasias	30/9/2004	11,6%	17,4%	2,90%	65,30%	6,90%	10,40%	2,90%	12413,60	4
Eurobank Ergasias	30/6/2004	11,7%	17,2%	2,50%	66,50%	7,00%	10,80%	3,00%	12818,40	4
Eurobank Ergasias	31/3/2004	10,2%	15,9%	2,60%	67,90%	6,90%	11,10%	2,90%	12755,30	4
Eurobank Ergasias	31/12/2003	10,4%	14,9%	0,70%	64,80%	7,00%	9,90%	3,10%	11002,00	4
Eurobank Ergasias	30/9/2003	11,5%	24,0%	0,65%	63,40%	7,10%	9,70%	3,30%	11210,10	4
Eurobank Ergasias	30/6/2003	12,0%	19,0%	0,67%	62,60%	7,15%	9,70%	3,70%	8541,40	4
Eurobank Ergasias	31/3/2003	13,9%	16,3%	0,70%	62,90%	7,20%	9,80%	3,90%	7871,70	4
Eurobank Ergasias	31/12/2002	11,7%	14,1%	3,20%	63,20%	7,20%	10,00%	3,50%	9146,10	4
Eurobank Ergasias	30/9/2002	11,9%	15,6%	2,90%	60,50%	6,90%	10,20%	3,80%	10827,80	4
Eurobank Ergasias	30/6/2002	13,6%	14,6%	2,50%	59,60%	6,30%	10,30%	3,60%	12179,60	4
Eurobank Ergasias	31/3/2002	13,2%	16,4	3,00%	59,80%	5,80%	10,70%	4,30%	12640,40	4
Eurobank Ergasias	31/12/2001	14,0%	17,6%	3,50%	59,00%	5,60%	10,80%	3,50%	14685,80	4
Eurobank Ergasias	30/9/2001	13,9%	16,3%	3,10%	58,60%	5,40%	10,70%	4,00%	15449,20	4
Eurobank Ergasias	30/6/2001	13,1%	16,9%	3,20%	59,40%	5,30%	10,50%	4,50%	18207,90	4
Eurobank Ergasias	31/3/2001	12,5%	15,1%	2,90%	59,10%	5,00%	10,50%	3,20%	17879,80	4